

WHAT IS CLAIMED IS:

1. In a snow plow having a snow plow frame for installation at the front of a vehicle, a shock-absorbing structure for cushioning the impact between a snow plow blade and a snow plow frame which supports the snow plow blade therefrom at a limit of movement of said snow plow blade, said shock-absorbing structure comprising:

a blade support frame member having right and left ends, said blade support frame member being supported by the snow plow frame which is mounted at the front of the vehicle;

said blade support frame member including blade mounting members which are fixedly mounted adjacent said right and left ends of said blade support frame member, respectively, said blade mounting members each defining a pivot point;

a snow plow blade having a frame comprising vertically oriented mounting ribs, each of said mounting ribs defining a pivot point;

connecting members used to pivotally connect corresponding ones of said mounting ribs to said blade mounting members, said snow plow blade being pivotable between a blade return position and a blade tripped position;

blade biasing members which urge said snow plow blade from said blade tripped position to said blade return position; and

a plurality of cushion stops mounted on one of said blade support frame member and said snow plow blade, said cushion stops being contacted by the other of said blade support frame member and said snow plow blade as said snow plow blade pivots prior to reaching at least one of said blade tripped position and said blade return position, said cushion stops thus absorbing a substantial portion of the impact force

36 which would otherwise be transferred to said blade
37 support frame member.

1 2. A blade mounting structure as defined in Claim 1,
2 wherein said blade support frame member is pivotally
3 mounted from said snow plow frame.

1 3. A blade mounting structure as defined in Claim 1,
2 wherein said frame of said snow plow blade comprises:
3 a top plow frame member;
4 a bottom plow frame member; and
5 a plurality of ribs extending between said top
6 and bottom plow frame members, said mounting ribs
7 being two of said plurality of ribs.

1 4. A blade mounting structure as defined in Claim 3,
2 wherein said top and bottom plow frame members and
3 said plurality of ribs are all made of steel and are
4 welded together to form said frame of said snow plow
5 blade.

1 5. A blade mounting structure as defined in Claim 1,
2 wherein said pivot point in each of said mounting ribs
3 is defined by an aperture extending through each of
4 said mounting ribs.

1 6. A blade mounting structure as defined in Claim 5,
2 wherein said right and left blade mounting members
3 each comprise:
4 a first blade pivot mount which is mounted on
5 said blade support frame member near an end thereof,
6 said first blade pivot mount extending forwardly from
7 said blade support frame member; and
8 an aperture extending through said first blade
9 pivot mount in the portion thereof which extends
10 forwardly from said blade support frame member;

11 wherein said aperture in said right mounting rib is
12 connected to said aperture in said first blade pivot
13 mount which is mounted on said right end of said blade
14 support frame member with one of said connecting
15 members, and wherein said aperture in said left
16 mounting rib is connected to said aperture in said
17 first blade pivot mount which is mounted on said left
18 end of said blade support frame member with another of
19 said connecting members.

1 7. A blade mounting structure as defined in Claim 6,
2 wherein said right and left blade mounting members
3 each additionally comprise:

4 a second blade pivot mount which is mounted on
5 said blade support frame member at a location which is
6 adjacent said first blade pivot mount but is spaced
7 away from said first blade pivot mount sufficiently
8 far to admit one of said mounting ribs therebetween,
9 said second blade pivot mount extending forwardly from
10 said blade support frame member; and

11 an aperture extending through said second blade
12 pivot mount in the portion thereof which extends
13 forwardly from said blade support frame member, said
14 apertures in said first and second blade pivot mount
15 members being aligned;

16 wherein said one of said connecting members extends
17 sequentially through said aperture in said first blade
18 pivot mount which is mounted near said right end of
19 said blade support frame member, said aperture in said
20 right mounting rib, and said aperture in said second
21 blade pivot mount which is close adjacent said first
22 blade pivot mount which is mounted near said right end
23 of said blade support frame member, and wherein said
24 other of said connecting members extends sequentially
25 through said aperture in said first blade pivot mount
26 which is mounted near said left end of said blade
27 support frame member, said aperture in said left

28 mounting rib, and said aperture in said second blade
29 pivot mount which is close adjacent said first blade
30 pivot mount which is mounted near said left end of
31 said blade support frame member.

1 8. A blade mounting structure as defined in Claim 1,
2 wherein said connecting members each comprise:
3 a pin; and
4 a retaining member secured to said pin to retain
5 said pin in place.

1 9. A blade mounting structure as defined in Claim 1,
2 additionally comprising:
3 retaining members for removably retaining said
4 cushion stops in place.

1 10. A blade mounting structure as defined in Claim 9,
2 wherein said cushion stops each have an aperture
3 located therein, and wherein said one of said blade
4 support member and said snow plow blade has a
5 plurality of additional apertures located therein,
6 said aperture in each of said cushion stops and one of
7 said additional apertures being aligned when said
8 cushion stops are mounted in position, and wherein
9 said retaining members comprise:
10 a bolt which extends through said aperture in
11 each said cushion stop and one of said additional
12 apertures to retain said cushion stop in said pocket;
13 and
14 a nut threaded onto said bolt to retain said bolt
15 in position.

1 11. A blade mounting structure as defined in Claim 1,
2 wherein said cushion stops are retained in position
3 with an adhesive.

1 12. A blade mounting structure as defined in Claim 1,
2 wherein said cushion stops are made of polyurethane.

1 13. A blade mounting structure as defined in Claim
2 12, wherein said cushion stops are made of Quazi
3 formulated methylenebisdiphenyl diisocyanate (MDI)
4 polyester-based polyurethane.

1 14. A blade mounting structure as defined in Claim 1,
2 wherein said cushion stops are made of a material
3 having a hardness of approximately 93 durometer on the
4 Shore A scale.

1 15. In a snow plow having a snow plow frame for
2 detachable installation at the front of a vehicle, a
3 shock-absorbing structure for cushioning the impact
4 between a snow plow blade and a snow plow frame which
5 supports the snow plow blade therefrom at a limit of
6 movement of said snow plow blade, said shock-absorbing
7 structure comprising:

8 a blade support frame member having right and
9 left ends, said blade support frame member being
10 supported by the snow plow frame which is detachably
11 mounted at the front of the vehicle, said blade
12 support member comprising:

13 a first blade pivot mount assembly which is
14 mounted on said blade support frame member near
15 said right end thereof, said first blade pivot
16 mount assembly extending forwardly from said
17 blade support frame member, said first blade
18 pivot mount assembly having at least one aperture
19 extending therethrough in the portion thereof
20 which extends forwardly from said blade support
21 frame member; and

22 a second blade pivot mount assembly which is
23 mounted on said blade support frame member near
24 said left end thereof, said second blade pivot

25 mount assembly extending forwardly from said
26 blade support frame member, said second blade
27 pivot mount assembly having at least one aperture
28 extending therethrough in the portion thereof
29 which extends forwardly from said blade support
30 frame member;

31 a snow plow blade having a frame comprising a top
32 plow frame member, a bottom plow frame member, and a
33 plurality of vertically oriented curved ribs extending
34 between said top and bottom plow frame members, said
35 plurality of vertically oriented curved ribs including
36 mounting ribs which each have an aperture extending
37 therethrough, which apertures in said right and left
38 mounting ribs define a pivot point for said snow plow
39 blade;

40 a plurality of connecting members used to
41 pivotally connect said mounting ribs to corresponding
42 ones of said blade pivot mounts, said snow plow blade
43 thereby being pivotable between a blade return
44 position and a blade tripped position;

45 blade biasing members which urge said snow plow
46 blade from said blade tripped position to said blade
47 return position; and

48 a plurality of cushion stops mounted on one of
49 said blade support frame member and said snow plow
50 blade, said cushion stops being contacted by the other
51 of said blade support frame member and said snow plow
52 blade as they pivot prior to said snow plow blade
53 reaching either said blade tripped position or said
54 blade return position, said cushion stops being made
55 of a hard, resilient, durable man-made material to
56 absorb a substantial portion of the impact force which
57 would otherwise be transferred to said blade support
58 frame member.

1 16. A shock-absorbing structure for cushioning the
2 impact between a snow plow blade and a snow plow frame

3 which may be installed at the front of a vehicle, said
4 shock-absorbing structure comprising:

5 a blade support frame member with right and left
6 ends which is supported from the snow plow frame which
7 may be installed at the front of the vehicle, said
8 blade support member having blade mounting members
9 which are fixedly mounted adjacent said right and left
10 ends of said blade support frame member;

11 mounting ribs contained in a frame of a snow plow
12 blade which are pivotally mounted to corresponding
13 ones of said blade mounting members, respectively,
14 said snow plow blade thereby being pivotable between a
15 blade return position and a blade tripped position;

16 blade biasing members which urge said snow plow
17 blade from said blade tripped position to said blade
18 return position; and

19 cushion stops mounted on one of said blade
20 support frame member and said snow plow blade, said
21 cushion stops being contacted by the other of said
22 blade support frame member and said snow plow blade
23 and absorbing a substantial portion of the impact
24 force as said snow plow blade pivots prior to reaching
25 at least one of said blade tripped position and said
26 blade return position.

1 17. A method of cushioning the impact between a snow
2 plow blade and a snow plow frame which may be
3 installed at the front of a vehicle, said method
4 comprising:

5 supporting a blade support frame member having
6 right and left ends from the snow plow frame which is
7 installed at the front of the vehicle;

8 fixedly mounting blade mounting members adjacent
9 said right and left ends of said blade support frame
10 member;

11 pivotally mounting mounting ribs contained in a
12 frame of a snow plow blade to corresponding ones of

13 said mounting members, said snow plow blade thereby
14 being pivotable between a blade return position and a
15 blade tripped position;

16 biasing said snow plow blade from said blade
17 tripped position to said blade return position; and

18 mounting a cushion stop on one of said blade
19 support frame member and said snow plow blade, said
20 cushion stops being contacted by the other of said
21 blade support frame member and said snow plow blade
22 and absorbing a substantial portion of the impact
23 force as said snow plow blade pivots prior to reaching
24 as least one of said blade tripped position and said
25 blade return position.